Interference Effects into Low VHF Television Arising From Broadband Over Power Line

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Executive Summary

This report analyzes the potential for interference from Broadband over Powerline (BoPL) into low VHF television in two different neighborhoods in the Los Angeles area. The analysis was performed using the Numerical Electromagnetic Computation (NEC) program from Lawrence-Livermore Laboratories.

Broadband over Power Line (BoPL) is a technique for providing broadband internet service to individual customers using existing AC distribution power lines to convey the data. Current FCC rules allow the data signals impressed upon the power lines to use frequencies that extend well into the low VHF television band (54 to 88 MHz).

The report concludes that Part 15 compliant Broadband Over Power Line (BoPL) signals will cause material interference into television channels 2 through 5 to the extent of rendering these channels unusable in many realistic cases.

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1 Description of Modeled Neighborhoods

Two sections of medium voltage residential distribution in the greater Los Angeles area were selected to model the potential interference from BoPL into low VHF television at radio. One of the sections modeled was served by the Los Angeles Department of Water and Power (LADWP); the other section was served by Southern California Edison (SCE). Both sections were in residential areas and appeared to use 12 kV 3 wire distribution with no medium voltage neutral, *i.e.*, residential distribution transformer primaries are connected between two phases.

Each of the two neighborhoods modeled is a typical residential area without any unusual features. In the beginning of each of the two following sections there are photographs showing the neighborhoods as well as the medium-voltage AC distribution.

1.1 West Los Angeles Section

This section of residential medium voltage distribution is located in West Los Angeles and is served by LADWP. Figure 1 shows the schematic layout in plan. Figures 2 through 9 show annotated photographs of the neighborhood. Figures 10 through 16 show photographs of the tops of the poles involved.

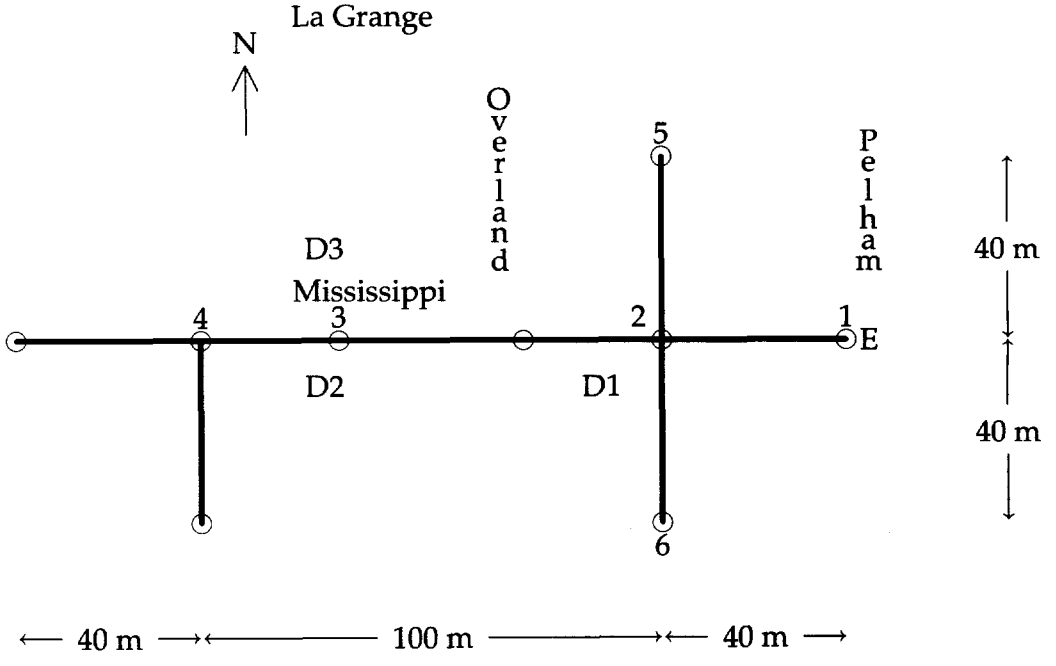

Figure 1: Layout of West Los Angeles Distribution Section "E" indicates where excitation is applied. "Dn" indicates where Dipole n is located. The numbered circles indicate the location of power pole n.